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A glance at the map with which the paper is illustrated suggests the thought that we have in Professor Webster's article a strong defense of the Wallacean theory of distribution and of the important part played by barriers in determining the spread of animal life; it is to be regretted that the recent propaganda of the theory of isothermal distribution of organisms, while undoubtedly of great value in indicating the possibility of artificial cultivation, has tended to obscure the importance of geographical features under really natural conditions.

H. F. WICKHAM.

BOTANY.

Livingston's Osmotic Pressure and Diffusion in Plants.[1] — The author begins with a treatment of the purely physical phenomena connected with diffusion and osmosis, rightly holding that it is difficult for the student of physiology to easily obtain the information he needs in compact form. Such a treatment covering, as it does but forty-four pages could not possibly be detailed, nor does the author maintain that it is. Nevertheless a summary of this kind can be exceedingly useful, if in no other way than to stimulate the student to further reading. This *résumé* is clear and sufficiently full to give an adequate conception of the theories concerned. There are six chapters in the first part, which treat of the fundamental theories of the nature of matter, of diffusion and diffusion tension, of solutions and ionization, of osmotic phenomena and the measurement thereof.

In the second part on the physiological aspect of the matter, the author continues his summarization of the work which has been done, but of course in far greater detail than in the previous half, since the field is smaller and since this is the real object of the book. In the first chapter the question of turgidity is taken up. The importance of this subject demands full treatment, and forty-two pages are devoted to it; the author does not develop anything new, however. In the even more complicated, and certainly more dubious, matter of the absorption and transmission of water, which is considered in the second chapter, there is hardly space enough allowed for a very complete discussion of the question. The optimistic point of view is taken that when the nature of the plasmic membranes is known, "it is not improbable that the solution of the problem of water transport will follow as the simplest corollary." In the next chapter the absorption and transmission of solutes is treated of, the important matter of quantitative selection is somewhat lightly referred to, and one is lead to the belief that it is either taken as a matter of course, or that the author does not consider it of the same importance that many physiologists do. Simple diffusion is said to be the greatest factor in the distribution of solutes in the plant body. As to the influence of the osmotic pressure of the surrounding medium upon organisms, which is the subject of the final chapter, the author gives a summary of his own work in that line and of that of other investigators. Investigations have shown that growth is accelerated in weak solutions of various substances and retarded in concentrated ones. Cell division may also be influenced by the osmotic pressure of the surrounding medium, and reproduction being a peculiar form of cell division is apparently dependent, in some cases, upon the pressure. Whether the effect is due merely to the extraction of water, or to a strictly chemical influence the author does not decide.

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[1] Livingston, Burton E. *The Role of Diffusion and Osmotic Pressure in Plants.* The Decennial Publications of the University of Chicago. Second Series, vol. 7. The Univ. of Chicago Press, 1903. 8vo, pp. i–xiii, 1–149.

While there is not a great deal that is new in the volume it is an excellent brief review of the various questions as they stand to-day. As a reading book for more advanced students in physiological botany the book will have considerable value, and it is one which may well be placed upon the shelves of the laboratory reference library. As a final source of information it cannot of course be satisfying, but the copious references to the literature make it valuable in this respect also. There is a distinct place for a book of this character.

H. M. R.

Pierce's Plant Physiology.[1] — In his preface the author expresses his desire to fill the gap in text books which exists between the monumental work of Pfeffer on the one hand, and the clever but short account of plant physiology which is found in Stasburger's text-book. The intention to furnish a good reading book of this character is certainly a laudable one, and in so far as the author has succeeded, he is to be congratulated. It is further stated that only "safe views"

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[1] Pierce, G. J. *A Text-Book of Plant Physiology.* New York, Henry Holt & o. 1903. 8vo., vi–291 pp., 22 figs.